United States Department of Agriculture | Forest Service | Arizona Zone Entomology & Pathology | 2500 S. Pineknoll Dr. Flagstaff, AZ 86001

File Code: 3400 **Date:** September 15, 1997
Route To:

Subject: Functional Assistance on Hazard Tree Incident at Christopher Creek Campground.

To: Jon Selby, Law Enforcement Officer

As you requested, here is my pathological analysis of the remains of the tree which snapped and caused injury in Christopher Creek Campground on August 8th, 1997. My conclusions were drawn from viewing the top and bottom sections of the defective area, and the stump, on my visit to the campground on August 27th. I also viewed the photos that were taken the day of the incident and consulted with two entomologists from our office, Michelle Frank and Jill Wilson.

The defective area which you measured at 18 feet up the tree was about 50% decayed. The decayed area was in the shape of a semicircle, where literally one-half of the cylinder of the tree was decayed and the cambium of that half was dead. Based on the condition of the stump and viewing some of the photos, the decay continued all the way down to the bottom of the tree (although the percent area decayed was less in the stump). The decayed wood is a combination of white rot and brown rot with no zone lines present. It is probably saprot, caused by fungi which decay dead wood. The decay region was also riddled with extensive insect galleries caused by flatheaded wood borers, roundheaded wood borers, and carpenter ants. You had found a click beetle. There was also some bluestain present which is often associated with bark beetles which feed in the cambium region and not in the wood itself. No bark beetle galleries were found in the small piece of bark sampled.

Although the bark had fallen away from the most advanced decay areas by the time I viewed the samples on August 27th, both the intact insect galleries in the cambium region and photos indicate that bark was present in the defective area at the time the tree failed. I would not have expected bark to be present with that much decay. Likewise, I would have expected to see a different pattern of decay with that much bark intact. Heartrot fungi decay the center of live trees, forming a column of decay surrounded by live wood and intact bark. In this case the cambium was dead on one side of the tree but the bark had not yet fallen away from the wood.

Given the amount of decay and presence of bark, the decay could have been moving upward from an injury the tree had incurred further down. It is likely, based on the damage throughout the tree trunk and the photo labeled 9 13:37, the tree had been struck by lightning a long time ago which had killed the cambium and allowed the deterioration to begin.

Tree failure was probably due to the loss in structural support from extensive

fungal decay and deterioration by insects combined with the strong wind that was reported the day of the incident. The decay was on the windward side of the tree and was so extensive that too much compressive force was put on the leeward side of the tree when the wind blew, so the tree snapped. I can not say wether or not the defects in this tree were detectable before it failed.

Since the tree sections were dried out from being cut away from the rest of the tree and stored under high temperatures I did not attempt to culture any fungi for identification.

If you have any questions about this letter please give me a call at (520)556-2075.

/s/ M. L. Fairweather
Mary Lou Fairweather
Plant Pathologist

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